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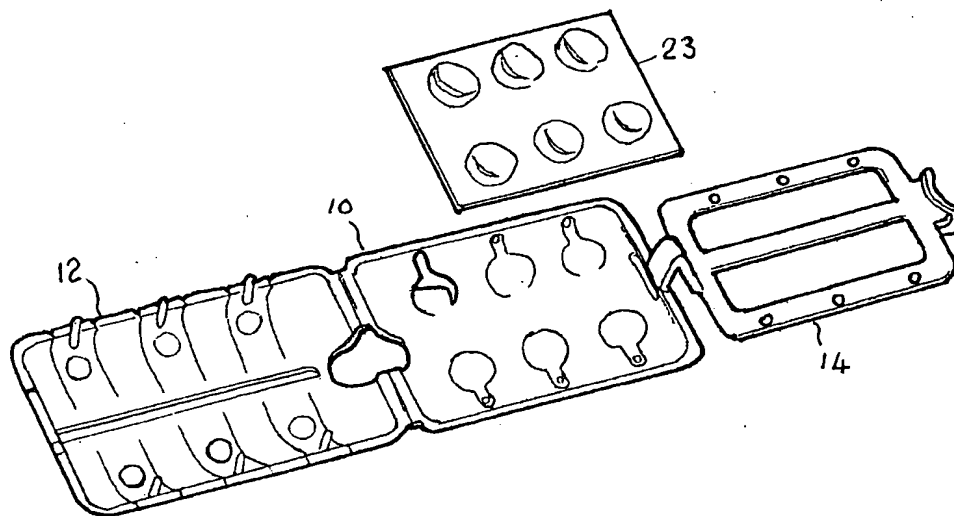
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(54) Title: DEVICE FOR DISPENSING FROM A BLISTER PACK



(57) Abstract: A blister pack dispensing device comprises a housing having first (10) and second (12) walls and containing a blister pack (23) and a movable frame (14). The first wall (10) has an array of apertures (11) which correspond to the array of blisters on the blister pack (23). The second wall (12) has an array of buttons (13) which are aligned with the apertures (11). Each button (13) is provided with a projection (22) while the frame (14) has corresponding apertures (15). The frame may be urged by a user to a first position in which the projections (22) on the buttons (13) are aligned with the apertures (15) to allow the buttons (13) to be depressed to disperse the blister contents through the apertures (11). A spring (17) restores the frame (14) to a second position, when released by the user, such that the projection (22) are misaligned with the apertures (15) on the frame (14) and prevent the buttons (13) being depressed.

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DEVICE FOR DISPENSING FROM A BLISTER PACK

The invention relates to a blister pack dispensing device and to a method of manufacturing such a device.

5 There is a requirement for devices to allow safe and simple dispensing of tablets and to prevent as far as possible young children obtaining access but to allow access by older and less dextrous persons, for example those suffering from conditions such as arthritis or whose grip is weak.

10 Medicines are often packaged in blister packs which comprise a plastic sheet having plurality of moulded receptacles (or blisters) in which one or more tablets are placed covered by a foil which is pierced or burst to obtain access to the contents of the blister. Such
15 blister packs are known in two forms, a standard form with a burstable foil which can be easily "popped" and a child resistant form which has a thicker non-burstable foil. The non-burstable foil is normally peeled off to expose a standard burstable foil. This peeling process may be
20 difficult for persons suffering from arthritis or having a weak grip so cutting tools have been provided to pierce the foil. A more dangerous alternative is to use a pair of scissors.

25 US-A-51504793 discloses a device for inhibiting removal of an article from a blister-type container having at least one blister. The device includes a housing surrounding at least a portion of the container sized to permit movement of the container between the first and second positions. The housing has a base positioned facing the blister-type
30 container with at least one base opening in registry with the blister when the container is in the first position.

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The base opening is sized to permit passage of the article therethrough. The device also includes a biasing member for biasing the container toward the second position. When the container is in the second position, the base of the housing is positioned to inhibit removal of the article from the container. When the container is moved by an individual against the bias of the biasing member to the first position, the blister is in registry with the base opening to permit removal of the article by applying pressure to the outside surface of the blister to force the article to rupture the container and pass through the base opening.

US-A-5244081 discloses a device for inhibiting removal of a first article from a first blister-type container having at least one blister. The device includes a first member or second blister-type container positioned facing the first blister-type container with at least one opening in the second container in registry with the blister when the second container is in the first position. The first container likewise may include an opening in registry with a second blister of the second container when the second container is in the first position. The openings in the first and second containers are sized to permit passage of the respective articles therethrough. When the second container is in the second position, the second container is positioned to inhibit removal of a first article from the first container and the first container is positioned to inhibit removal of a second article from the second container. The device may also include a first member for permitting movement of the second container between the first and second positions and a second member for maintaining the second container proximate the container and permitting movement of the second container between the first and second positions. A locking member may be

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provided for locking the containers in the second position.

The invention provides a blister pack dispensing device comprising a housing for accommodating the blister pack, the housing comprising a first wall provided with
5 plurality of apertures arranged to correspond to blisters on the blister pack, a second opposing wall carrying a corresponding plurality of buttons, and a manually operable locking mechanism for enabling or disabling
10 depression of the buttons, the locking mechanism comprising a movable stop member the stop member being movable between a first position in which one or more of the button(s) is/are enabled to be operated to dispense the contents of a blister through an aperture and a second
15 position in which the button is prevented from being operated to dispense the contents of the blister.

By providing a locking mechanism, which will be released by a manual operation by a user, the release of the contents of a blister by pressing one of the buttons can
20 be inhibited unless two separate operations are carried out, that is release of the locking mechanism and depression of one of the buttons

The movable stop member may comprise a frame which surrounds at least some of the blisters of the blister
25 pack.

In this case, the blister pack can remain stationary within the housing while the frame in the first position allows the buttons to be fully depressed to eject the contents from the blister through the corresponding
30 aperture in the housing while in the second position the

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frame prevents the buttons being sufficiently depressed to eject the contents of the blister.

In an alternative embodiment the blister pack itself can constitute the locking mechanism.

- 5 The movable stop member may be provided with a plurality of openings each corresponding to a button, the buttons being provided with projections projecting in the direction of depression of the button; wherein in the first position the openings are aligned with the
10 projections on the button to allow the projections to pass through the movable member and the buttons to be fully depressed while in the second position the projections engage the movable member to prevent the buttons from being fully depressed.
- 15 This construction gives the advantage that the projections and openings in the frame can be of smaller area than the buttons and consequently the distance between the two positions can be relatively small. This enables the spacing between the blisters to be minimised.
- 20 Alternatively the movable stop member may be provided with a plurality of projections each corresponding to a button, the buttons being provided with openings for accommodating the projections, wherein in the first position the projections are aligned with the openings in the buttons
25 to allow the buttons to pass over the projections and fully depress while in the second position the projections engage the buttons to prevent them from being fully depressed.

In a further alternative embodiment the movable stop
30 member is provided with a plurality of projections each

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corresponding to a button, wherein in the first position the projections are misaligned with the buttons to allow the buttons to fully depress while in the second position the projections engage the buttons to prevent them from
5 being fully depressed.

The movable stop member may comprise an elongate member having projections that are arranged to prevent operation of the buttons when the elongate member is in a first position and to allow operation of at least some of the
10 buttons when in a second position.

The elongate moveable stop member may be moveable longitudinally between the first and second positions. Alternatively, the elongate movable stop member may be arranged to rotate between the first and second positions.

15 Cutters, which may be integrally moulded with the first wall, may be provided around the apertures on the interior of the first wall, the cutters being effective to pierce the foil covering a blister when the corresponding button is depressed.

20 The provision of cutters in the dispensing pack enables convenient dispensing of the contents of child resistant blister packs, that is those packs which have a strong foil over the blister which needs a cutting tool to pierce it. In addition it also enables the dispensing of blister
25 contents which may be damaged by the pressure required to pierce the foil when transferred through the contents.

The apertures may be provided with frangible covers which are displaced by the act of dispensing the contents of a blister.

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This reduces the possibility of the contents of a blister being accessed through an aperture by piercing the foil and allowing the contents to drop through the aperture. Thus the use of child resistant blister packs is not
5 required when using such a dispensing device.

The invention further provides a method of manufacturing a blister pack dispensing device comprising the steps of: producing a one piece thermoplastic moulding comprising a first wall of a housing having a plurality of apertures
10 spaced to correspond with the spacing of a blister pack to be contained within the dispenser and a second wall of the housing having a plurality of buttons spaced to align with the apertures when the dispenser is assembled, the first and second walls being joined by a flexible web portion;
15 folding the first and second walls about the flexible web to enclose a blister pack; and joining the two walls together to form the housing.

The method may comprise the further step of inserting a movable frame between the first and second walls. The
20 method may further comprise the further step of moulding the movable frame integrally with the first and second walls and connecting the movable frame to the opposite end of one of the first and second walls by a second flexible web.

25 The second web may be joined to a spring means on the frame and when the dispensing device is assembled the spring means may act as a biasing means for the movable frame. The first and second walls may be joined by a snap fit mechanism.

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These features lead to a small number of steps being required to manufacture a dispensing device maximising the convenience and minimising the cost of manufacture.

5 The above and other features and advantages of the invention will be apparent from the following description, by way of example, of embodiments of the invention with reference to the accompanying drawings, in which:

Figure 1 shows a perspective view of a dispensing device according to the invention;

10 Figure 2 shows in unassembled form a first embodiment of a dispensing device according to the invention;

Figure 3 shows in unassembled form a second embodiment of a dispensing device according to the invention;

15 Figure 4 shows in unassembled form a third embodiment of a dispensing device according to the invention;

Figure 5 shows a cross-sectional view of part of a fourth embodiment of a dispensing device according to the invention;

20 Figure 6 shows plan and cross-sectional views of frangible covers;

Figure 7 is a perspective view of a fifth embodiment of a dispensing device according to the invention;

25 Figure 8 shows the embodiment of Figure 7 in an exploded perspective viewed from the side of the second wall;

Figure 9 shows an exploded view of the embodiment of Figure 7 viewed from the side of the first wall;

30 Figure 10a shows a plan view of the embodiment of Figure 7;

Figure 10b shows a cross-sectional view on line B-B of Figure 10a;

Figure 11a shows a plan view of the embodiment of Figure 7;

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Figure 11b shows a cross-sectional view on line C-C of Figure 11a on an enlarged scale;

Figure 12 is a perspective view of part of a wall 120 of Figure 8 on an enclosed scale showing an additional optional feature;

Figures 13a to 13c show a sixth embodiment of a dispensing device according to the invention;

Figure 14 shows a perspective view of a seventh embodiment of a dispensing device according to the invention in the form of a one piece moulding before assembly to form the dispensing device;

Figure 15 shows on elevation of a part of the embodiment of Figure 13;

Figure 16 shows in perspective view the moulding of Figure 14 assembled to form the seventh embodiment of a dispensing device according to the invention; and

Figure 1 is a perspective drawing of a blister pack dispensing device according to the invention which comprises a housing 1 for containing a blister pack, the housing 1 having an array of buttons 2 which corresponds to the array of blisters on the blister pack for which the device is designed. The housing 1 has an aperture 3 through which a button 4 projects, the button 4 forming part of an inhibit frame whose function is to lock the buttons 2 unless the button 4 is depressed. When the button 4 is depressed buttons 2 are unlocked and may be depressed to dispense the contents of the blisters through apertures on the underside of the housing 1. Thus, in order to dispense the contents of a blister pack contained within the housing 1 it is necessary to perform two operations simultaneously, that is depression of the button 4 to unlock the buttons 2 and depression of one of the buttons 2 to push the contents of a blister through an aperture in the underside of the housing 1.

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Figure 2 shows in unassembled form a first embodiment of a blister pack dispensing device according to the invention, Figure 2a showing the device in plan view, Figure 2b showing the device in an elevational view, and Figure 2c showing the device in perspective view. As shown in Figure 2 the dispensing device comprises a first wall 10 having an array of apertures 11 formed therein. A second wall 12 is formed with a corresponding array of buttons 13, which are arranged so that when the device is assembled the buttons 13 are aligned with the apertures 11. A movable frame 14 has a plurality of apertures 15 which correspond to the buttons 13 in the second wall 12. The movable frame 14 is connected to the first wall 10 by means of a flexible web or hinge 16 and a portion 17 that, in operation, forms a biasing means for the frame 14, while the first wall 10 is connected to the second wall 12 by a further flexible web or hinge 18.

The movable frame 14 is provided with a projecting button 19 that, when the device is assembled, projects through an aperture 20, the button 19 corresponding to the button 4 in the device of Figure 1. In addition, in this particular embodiment, the apertures 11 are covered by frangible covers (or trapdoors) 21 and each button in the array of buttons 13 is provided with a projection 22.

In order to assemble the dispensing device shown in Figure 2 a blister pack 23 is placed over the frame 14 as shown in Figure 2b and the frame 14 is folded about the web 16 to lie against the wall 10 of the housing. It will be apparent that the blister pack 23 is sandwiched between the frame 14 and the wall 10 of the housing with the foil side of the blister pack facing the wall 10 and the blisters projecting through the inhibit frame 14. The

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wall 12 is then folded about the web 18 and a latching projection 24 snap fits over the end of the wall 10 to hold the device closed. Other means for holding the device together may be used, for example heat sealing staking, or ultrasonic welding the two outer walls 10 and 12 or using an adhesive, but the illustrated method allows re-use of the device by enabling the housing to be opened allowing the insertion of another blister pack when the contents of the first blister pack have been dispensed. If the dispensing devices are to be re-used it is advantageous to provide covers 21 which are also re-usable or to dispense with the covers.

Once the device of Figure 2 has been assembled it has the appearance of the device shown in Figure 1 and in operation the frame 14 is biased by the spring 17 to a position where the apertures 15 are misaligned with the projections 22 on the buttons 13 to prevent the buttons from being sufficiently depressed to eject the contents of the blisters. In order to dispense the contents of a blister the user presses the button 19 against the spring 17 to align the apertures 15 in the frame 14 with the projections 22 on the buttons 13. As a result the projections 22 can pass through the apertures 15 allowing the buttons 13 to be fully depressed (as can be seen more clearly from Figure 5). Where frangible covers 21 are provided over the apertures 11 the projection 22 on the button 13 presses on the cover 21 to break the frangible coupling between the cover and the wall 10 and allow the contents of the blister to be dispensed through the aperture by further depression of the button 13.

As will be apparent from the above description the dispensing device shown in Figure 2 is formed from a single plastic moulding and has the advantage of requiring

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only a small number of manufacturing steps in order to assemble it. The only components are the blister pack and the single moulding which merely requires folding operations, once the blister pack has been placed in position, to form the completed device.

Figure 3 shows in unassembled form, a second embodiment of a dispensing device according to the invention, Figure 3a showing the device in plan view, Figure 3b showing the device in an elevational view, and Figure 3c showing the device in perspective view. In Figure 3 those elements having the same form and function as corresponding elements in the embodiment of Figure 2 have been given the same reference numerals. The following description will highlight the differences between the embodiments of Figure 2 and 3 rather than repeating the description of the common elements. The significant difference is that the frame 14 is moulded as a separate component from the walls 10 and 12 of the housing. While this embodiment requires more parts and further assembly steps it has the advantage that the housing walls 10 and 12 can be moulded from a different plastics material from that of the frame 14. This enables the most suitable material to be chosen for each part, for example the spring 17 and frame 14 may be moulded from Delrin while the walls 10 and 12 may be moulded from polypropylene. It will also be apparent from the Figures that the blister pack 23 is positioned on the opposite side of the frame 14 but this is an inessential difference as in both embodiments it is possible to place the blister pack 23 on either side of the frame 14.

Figure 4 shows in unassembled form, a third embodiment of a dispensing device according to the invention, Figure 4a showing the device in plan view, Figure 4b showing the device in an elevational view, and Figure 4c showing the

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device in perspective view. In Figure 4 those elements having the same form and function as those shown in Figure 2 have been given the same reference numerals. The following description will highlight the differences
5 between this embodiment and that shown in Figure 2 and not repeat a description of the common elements. The embodiment of Figure 4 is designed to be able to dispense the contents of child resistant or other blister packs which have a relatively strong foil which cannot be broken
10 merely by applying pressure to the blister which is transferred to the foil by the contents of the blister. Such blister packs need a cutting tool to remove the foil and while resistant to opening by young children cause difficulty to those whose manual dexterity is limited, for
15 example due to arthritis. The embodiment may also be useful even where a strong foil is not provided but where the contents of the blister are fragile and likely to be damaged by the force necessary to burst the foil.

In the embodiment of Figure 4 the apertures 11 are
20 surrounded by cutters 25 rather than being provided with frangible covers. In addition the buttons 13 are not provided with projections as these are not required to break the frangible covers. The frame 14 is provided with apertures 26 through which the blisters on the blister
25 pack project when the device is assembled. With this particular embodiment the blister pack 23 moves as the frame 23 moves so that in a first position the blisters are not aligned with the apertures 11 and a second position where they are aligned with the apertures 11.
30 Thus when a button 13 is depressed the blister contents can only be dispensed when a blister is located above the cutters 25 around the aperture 11. Otherwise the blister pack 23 is positioned such that the button 13 will not engage with the blisters.

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As a modification of the embodiment shown in Figure 4 the buttons may be provided with projections 22 and the frame 14 with additional apertures 15 which cooperate with the projections 22 to provide a locking mechanism for the buttons 13 in the same manner as described with reference to Figures 2 and 3. In addition the frame 14 may be of the skeletal form shown in Figures 2 and 3. This enables the blister pack to be located in a stationary manner with respect to the apertures 11, the frame 14 sliding across the blister pack. The frame 14 shown in Figure 4 may have the advantage of holding the blister pack 23 more firmly against the cutters 25 when dispensing the contents but will cause the blister pack 23 to slide with respect to the apertures 11 and cutters 25. In order to prevent the cutters 25 from damaging the foil on the blister pack when it slides between the misaligned and aligned positions the interior of the wall 10 is provided with a rib 27 which spaces the blister pack from the wall, and hence the cutters 25, except when a button 13 is depressed above a blister when the blister pack deforms to allow the cutter to pierce the foil. The under surface of the button 13 may be profiled to extend around the blister when depressed to hold the pack firmly against the cutters 25.

Figure 5 is a cross-sectional view on line x-x of Figure 1 showing the assembled embodiment of Figure 2. Figure 5a shows the frame 14 in its inhibit position where it prevents the button 13 from being depressed as the projection 22 on the button 13 engages with the surface of the frame 14. Figure 5b shows the situation where a user has moved the frame 14 against the biasing spring 17 to a position where the projection 22 on the button 13 is aligned with the aperture 15 in the frame 14. Figure 5c shows the button 13 being depressed to dispense the contents of a blister of the blister pack 23. As shown in

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Figure 5c the projection 22 passes through the aperture 15 and engages with the frangible cover 21 to cause it to break away. The button 13 then presses on the blister causing the contents to break through the foil and be
5 dispensed through the aperture 11.

Devices having frangible covers over the dispensing apertures will generally be single use, since once the frangible covers have been broken there will no longer be any means to prevent access to the blister contents
10 through the apertures 11. Consequently it would not be desirable to refill the device with a new blister pack. An alternative might be to provide the covers 21 with a hinge at one point and to provide a latching mechanism at a diametrically opposite side. Thus the projection 22
15 could operate the latching mechanism to allow the cover 21 to hinge outwardly while once the contents of the blister have been dispensed it is possible to replace the cover in the closed position. This could be achieved in a manner similar to battery compartment covers on portable
20 electrical equipment.

In the embodiment of Figures 2 and 3 the provision of projections 22 on the buttons and apertures 15 on the frame 14 could be reversed, that is the frame 14 could be provided with projections while the buttons 13 are
25 provided with apertures. In this embodiment, however, the projections could not then be used to open the frangible covers shown in Figures 2 and 3. An additional modification would be to provide the frame 14 with projections which in the second position engage with the
30 lower surface of the buttons 13 and in the first position are outside the profile of the button 13. Although in the embodiment shown the apertures 15 are circular in form, they could be replaced by apertures of any other shape

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which would cooperate with the projections 22, or by slots which are not necessarily wholly enclosed within the frame 14.

5 In the further modification of the embodiment shown with reference to Figures 2 and 3 the frame 14 may be dispensed with. In this case the blister pack 23 forms the manually operable locking mechanism, the blister pack being provided with apertures 15 corresponding to the apertures 15 in the frame 14. The projections 22 will then either
10 pass through the blister pack to enable the buttons 13 to be fully depressed and eject the contents from the blister or additionally open the trap door if the frangible covers are provided. Again as an alternative the blister pack could be provided with the projections as previously
15 discussed with respect to the frame 14.

Figure 6 shows in plan and cross-sectional view three possible constructions for the frangible covers 21. As shown in Figure 5a the cover 21 is only connected to the wall 10 by a hinge section 51 and a small, typically
20 spherical, bridging member 52. The remainder of the periphery of the cover 21 is separated from the wall 10 by a small gap 53 around its perimeter. In operation the projection 22 on the push button 13 presses on a portion 53 of the cover 21 causing the bridging section 52 to
25 break and the cover 21 to open about the hinge 51. Figure 6b) shows a construction where instead of a gap 53 being left around the periphery of the cover 21 a frangible boundary is formed that is a boundary where the cross-section is reduced. Again the pressure of the projection
30 22 against the portion 53 of the frangible cover will cause the frangible boundary to split and the cover to hinge about the hinge 51. In this construction it would not be essential to have the hinge 51. As an alternative

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the cover could be allowed to completely fall out of the dispensing device along with the contents of the blister. This does suffer from the disadvantage, however, that the cover has to be separated from the contents of the blister before they can be used. Figure 6c shows a further alternative where instead of covering the whole of the aperture 11 a strap is provided across the aperture. Where the contents of the blister are relatively large compared with the size of the aperture it is not necessary to fully cover the aperture to prevent the contents from being released by breaking the foil through the aperture. Thus a relatively simple strap across the aperture will perform the same function as the cover shown in Figure 6a and will operate in the same manner. It should be noted that these covers are merely examples of those that could be implemented and are not intended to limit any embodiment of the invention to using one of these three illustrated covers. In particular the term frangible in respect of covers is intended to encompass any construction where internal pressure on the cover will cause it to displace sufficiently to provide space for the contents of a blister to be dispensed. Thus any sort of latching mechanism which holds the cover in place, whether reusable or not will provide a cover which is frangible in the sense that this term is used in the present application.

While the locking mechanism for the buttons 13 has been shown in the embodiments as a sliding member having apertures or projections for engaging or disengaging the buttons the invention is not limited to such a construction. Any manually operated locking mechanism which efficiently prevents the buttons from being fully depressed unless operated could be used. Preferably it should require the user to operate it at the same time as

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depressing the buttons but a sequential operation of the locking mechanism and the depression of the buttons could be used. One possible alternative locking mechanism could involve a rotatable member which lies across the buttons in one positions to prevent their depression and swivels away from the buttons to release them in a second position. Other mechanisms could be devised to perform this function and some examples are shown in the further embodiments described below.

10 The fifth embodiment of a dispensing device according to the invention which is illustrated in Figures 7 to 12 comprises a housing 101 containing a blister pack. The housing has an array of buttons 102 which correspond to the array of blisters on the blister pack for which the device is designed. The housing 101 has an aperture 103
15 through which part of an operable locking mechanism 104 projects. The locking mechanism 104 has a spring arrangement 105 which engages with the housing 101 to bias the locking mechanism 104 to a first position in which the buttons 102 are prevented from being depressed. The
20 locking mechanism 104 can be moved to a second position in which the buttons 102 are released so that they can be depressed by pressing against the end of the member 104 to push it further into the housing 101 against the force of the spring 105. The housing 101 comprises a first wall
25 110 which carries the buttons 102 and a second wall 120 which contains a plurality of apertures 124 covered by hinged covers 121.

The housing 101 is formed by the walls 110 and 120 between which are sandwiched the moveable stop member 104 and a
30 blister pack 130. The blister pack 130 is located against the wall 120 with the blisters positioned over the hinged aperture covers 121. The moveable stop member is

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constrained between the blister pack 104 and a groove 111 in the wall 110.

5 The buttons 102 have a sidewalls 112 and 113 which are separated by a gap 114. The actuation of the buttons 102 is effected by depressing the button 102 where upon the region of the gap 114 opens to enable the button to straighten and then collapse onto the top of a blister on the blister pack 130 to collapse the blister and eject the contents through the hinged cover 121. The straightening of the button 102 on depression causes it to elongate and cause a web 115 in the central groove 111 to flex inwardly. The button 102 on further pressure engages with a blister 131 on the blister pack 130 and further depression collapses the blister 131 and ejects the contents of the blister 131 through the hinged cover 121 and allows the web 115 to return to its original position.

20 The locking member 104 is of an elongate form and comprises a number of projections 140 which when the locking mechanism is in the locked position align with the webs 115 to prevent them being flexed inwardly thus preventing the buttons 102 from being depressed. When the locking mechanism 104 is pressed inwardly against the force of the spring 105 the projections 140 become misaligned with the webs 115 and allow the buttons to be depressed by allowing the webs 115 to flex inwardly.

30 The buttons 102 have a central rib 116 extending along their length. This central rib engages a blister 131 in the blister pack 130 to cause the blister to collapse and eject its contents through a hinge cover 121. It will be seen that the rib 116 contacts the blister 131 near to one edge of the blister. This off centre contact causes the blister to collapse under a lesser force than if the

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initial force was in the centre of the blister. The off centre contact when the content of the blister is a relatively large solid object such as a pill, filling the major portion of the blister, produces a more effective
5 tear of the foil as one edge of the pill is preferentially forced against a small area of the foil. The collapse of the blister is accentuated by the small contact area formed by the control rib on the underside of the button 102 with the blister surface leading to an initial fold of
10 the blister. The hinged cover 121 is hinged about a hinge 122 located at the edge of the blister 131 nearest to the point of contact of the rib 116 onto the blister 131. Thus the content of the blister on the cover relatively close to the hinge portion forces the hinge cover to open more
15 fully. This aids efficient dispensing of the contents of the blister 131 by providing the largest possible opening for the discharges of the blister contents.

In this embodiment the wall 110 is joined to the wall 120 by means of pegs 123 which are an interference fit in
20 holes 117 in the wall 110. This structure also adds rigidity to the housing around its perimeter. Other means of joining the two parts could be used, for example if the device is to be reusable with new blister packs then a 'snap-fit' arrangement analogous to that shown in the
25 embodiment of Figure 2 could be used. The locking mechanism 104 fits between the wall 120 and the wall 110 in the groove portion 111 and helps to provide rigidity to the whole structure. The locking mechanism 104 is arranged to prevent the walls 110 and 120 flexing towards
30 each other but is also arranged to have as little friction as possible between itself and those walls so that its resistance to depression of the end of the mechanism 104 is not so large as to make the operation of the mechanism 104 too stiff for those with a relatively weak grip to

- 20 -

operate. To this end it will be seen from Figure 10b) that the surface area of the mechanism 104 in contact with the groove 111 and blister pack 130 is kept relatively small.

5 As shown in Figure 11b which is a cross sectional view on line C-C of Figure 11 but on an enlarged scale to enable detail to be seen more clearly, a blister pack 130 is sandwiched between the wall 110 and wall 120. The blisters 131 are aligned with hinged covers or trap doors 10 121 in the wall 120 and with buttons 102 in the wall 110. The moveable stop member 104 slides over the blister pack 130 between the blisters 131 and is effective to prevent the buttons 102 from being depressed when in the first position. A rib 113 presses on the blister 121 when the 15 button 102 is depressed to cause the blister to collapse. The contents of the blister break the foil underneath the blister and as the button is depressed the trap door 121 is hinged open to allow the contents of the blister to be ejected. The trap door 121 is moulded so that it is 20 biased inwardly of the housing and is forced to lie flat when the housing is assembled by the bottom of the blister pack 130. It will be noted that the trap doors 121 are recessed with respect to the wall 120 to minimise the possibility of gaining access to the underside of the 25 blisters by prizing the trap door 121 open.

Figure 12 illustrates a modification in which a pointed projection 125 is moulded into an edge of the aperture 124. When the content of a blister is to be dispensed the foil on the blister pack under the blister aligned with 30 the aperture 124 is forced against the projection 125 causing a tear to be initiated. This reduces the force required to be transferred through the content of the

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blister to break the foil and thus allow the content to pass through the foil and the trapdoor 121.

Figure 13 shows a further embodiment of a blister pack dispenser according to the invention. Figures 13a) and b) are cross-sections on line D-D of figure 13c). Figure 5 13c) is a plan view with the top wall removed of a dispensing device according to the invention. As shown in figure 13a) a blister pack 201 having a plurality of blisters 211 is placed on the bottom portion of a 10 dispenser 200 so that it covers trap doors 202. A button 204 is depressed to move a moveable locking member 205 laterally inwards towards the blister pack. Buttons 206 are provided in the top wall 210 of the dispenser and are aligned with the blisters 211 on the blister pack 201 and 15 are provided with a projection 207 which contacts the blister 211 to collapse the blister and dispense its contents. A projection 208, when the button 204 is not depressed, makes contact with the bottom surface 200 of the dispenser pack preventing the button 206 from being 20 depressed. When the button 204 is depressed the moveable member 205 is moved towards the blister pack and contacts the projection 208 to deflect it so that it now contacts the trap door 202 rather than the bottom of the dispenser 200 enabling the button 206 to be depressed and to 25 dispense the contents of the blister 211. It will be seen that figure 13a) illustrates the situation where the button 206 cannot be depressed while figure 13b) illustrates the situation where the button 204 has been depressed. The moveable member 205, when the button 204 30 is depressed, moves laterally to deflect the projection 208 on the button 206 so that it engages with the trap door 202 rather than the bottom of the dispenser 200. The button 206 can then be depressed and deliver the contents of the blister through the trap door 202. The trap door

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202 is either formed with a frangible boundary with the dispenser 200 that can be broken by a relatively small force or is freely hinged along one side so that it opens with comparatively little force required.

5 Figures 14 to 16 show a further embodiment of a blister pack dispensing device according to the invention. Figure 14 shows a moulding from which the dispensing device is assembled. The moulding comprises a first wall 301 having a number of apertures 302 through which the contents of a
10 blister pack are to be dispensed. A further wall 303 has a number of pockets 304 which cover the blisters of a blister pack which is arranged to be housed between the walls 301 and 303. The wall 303 when the blister pack is assembled is folded over the wall 301. A moveable frame
15 305 having a button 306 attached thereto is, during assembly of the blister pack dispensing device, folded over the blister pack and below the wall 303. Tabs 307 are provided with a first projection 308 and a second projection 309 on the opposite side of the tab as shown in
20 figure 14. On assembly of the dispensing device the tab 307 is folded under the wall 301 so that the projection 308 projects through apertures 310 in the wall 301. In order to insert the projections 308 into the apertures 310 the flexible frame 305 has to be deflected by depressing
25 the button 306 so that cut outs 311 in the frame align with the apertures 310. The projection 308 then hooks over the frame 305 when the button 306 is released holding the tabs 307 in place.

30 It will be appreciated that when the dispensing device is assembled the tabs 307 cover the apertures 302 thus preventing any access to the content of the blister pack through those apertures. The tabs 307 can only be released when the button 306 is depressed thus aligning

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the cut outs 311 with the apertures 310 allowing the tab 307 to be released. The pockets 304 have a cross-shaped aperture 312 through their upper surface. When the tabs 307 are released they can be rotated around the pack so that the projection 309 which has a corresponding cross shaped section is inserted through the apertures 312 to deform the blister within the pocket 304 and eject the content of the blister through the aperture 302. The shape of the projection 309 and aperture 312 are preferably complementary but they do not need to be cross shaped and any conveniently shaped aperture could be provided. Further it is not strictly necessary that the apertures 312 are of complementary shape to the projection 309. It is merely necessary that the aperture 312 will enable the projection 309 to pass through it. Ideally the size of the aperture 312 should be smaller than the contents of the blister to prevent access to the contents from that side of the dispensing device. However blisters are normally sufficiently robust to resist entry by small children without a sharp cutting tool so the pockets 304 could be replaced by apertures through which the blister projects. It is however preferred that pockets 304 are provided to cover the blisters and that the apertures 312 are complementary in shape to the projection 309 and relatively small so that easy access to the blister is not allowed.

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CLAIMS

1. A blister pack dispensing device comprising a housing for accommodating the blister pack, the housing comprising a first wall provided with a plurality of apertures arranged to correspond to blisters on the blister pack, a second opposing wall carrying a corresponding plurality of buttons, and a manually operable locking mechanism for enabling or disabling depression of the buttons, the locking mechanism comprising a movable stop member, the stop member being movable between a first position in which one or more button(s) is/are enabled to be operated to dispense the contents of a blister through an aperture and a second position in which the button(s) is/are prevented from being operated to dispense the contents of the blister.

2. A device as claimed in Claim 1 in which the movable stop member comprises a frame which surrounds the blister pack.

3. A device as claimed in Claim 1 in which the movable stop member comprises the blister pack.

4. A device as claimed in any of Claims 1 to 3 in which the movable stop member is provided with a plurality of openings each corresponding to a button and the buttons are provided with projections projecting in the direction of depression of the button wherein in the first position the openings are aligned with the projections on the button to allow the projections to pass through the movable member and the buttons to be fully depressed while in the second position the projections engage the movable member to prevent the buttons from being fully depressed.

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5. A device as claimed in any of Claims 1 to 3 in which the movable stop member is provided with a plurality of projections each corresponding to a button and the buttons are provided with openings for accommodating the projections, wherein in the first position the projections are aligned with the openings in the buttons to allow the buttons to pass over the projections and fully depress while in the second position the projections engage the buttons to prevent them from being fully depressed.

6. A device as claimed in any of Claims 1 to 4 in which the movable stop member is provided with a plurality of projections each corresponding to a button, wherein in the first position the projections are misaligned with the buttons to allow the buttons to fully depress while in the second position the projections engage the buttons to prevent them from being fully depressed.

7. A device as claimed in Claim 1 in which the movable stop member comprises an elongate member having projections that are arranged to prevent operation of the buttons when the elongate member is in a first position and to allow operation of at least some of the buttons when in a second position.

8. A device as claimed in any of Claims 1 to 7 in which the moveable stop member is moveable longitudinally between the first and second positions.

9. A device as claimed in Claim 7 in which the movable stop member is arranged to rotate between the first and second positions.

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10. A device as claimed in any preceding claim in which the movable stop member is biased towards the second position.

5 11. A device as claimed in any preceding claim in which a tear propagator is moulded in or adjacent to the aperture to initiate and propagate a tear in the foil when a button is depressed.

10 12. A device as claimed in Claim 11 in which the tear propagator is a pointed projection that extends partially into the aperture.

13. A device as claimed in Claim 11 or Claim 12 in which the tear propagator is moulded integrally with the wall.

15 14. A device as claimed in any preceding claim in which cutters are provided around the apertures on the interior of the first wall, the cutters being effective to pierce the foil on a blister when the corresponding button is fully depressed.

20 15. A device as claimed in Claim 14 in which the cutters are moulded integrally with the wall.

16. A device as claimed in any preceding claim in which the apertures are provided with frangible covers which are displaced by the act of dispensing the contents of a blister.

25 17. A device as claimed in Claim 16 in which the frangible covers only partially cover the apertures.

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18. A device as claimed in Claim 16 or Claim 17 when dependent on Claim 3 in which when a button is depressed the corresponding projection engages with the frangible cover after passing through the opening to displace the
5 frangible cover.

19. A device as claimed in any of Claims 1 to 18 in which the apertures are covered by hinged covers that are displaced by the act of dispensing the contents of a blister.

10 20. A device as claimed in Claim 19 in which the hinged covers are moulded integrally with the first wall and re biases towards the interior of the housing.

21. A method of manufacturing a blister pack dispensing device comprising the steps of:

15 producing a one piece thermoplastic moulding comprising a first wall of a housing having a plurality of apertures spaced to correspond with the spacing of a blister pack to be contained within the dispenser and a second wall of the housing having a plurality of buttons
20 spaced to align with the apertures when the dispenser is assembled, the first and second walls being joined by a flexible web portion;

25 folding the first and second walls about the flexible web to enclose a blister pack; and joining the two walls together to form the housing.

22. A method as claimed in Claim 21 comprising the further step of inserting a movable frame between the first and second walls.

23. A method as claimed in Claim 21 further
30 comprising the step of moulding the movable frame

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integrally with the first and second walls such that it is connected to the opposite end of one of the first and second walls by a second flexible web.

5 24. A method as claimed in Claim 23 in which the second web is joined to a spring means on the frame and when the dispensing device is assembled the spring means acts as a biasing means for the movable frame.

10 25. A method as claimed in any of Claims 21 to 24 in which the first and second walls are joined by a snap fit mechanism.

26. A method as claimed in any of claims 21 to 25 in which the first and second walls are joined by heat sealing, staking, ultrasonic welding, or an adhesive.

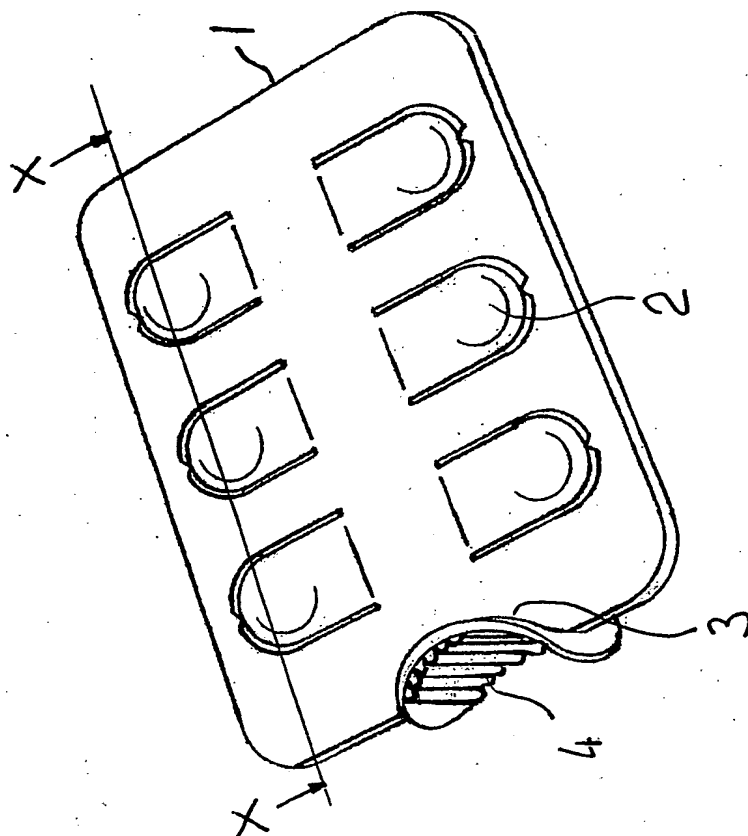


FIG. 1

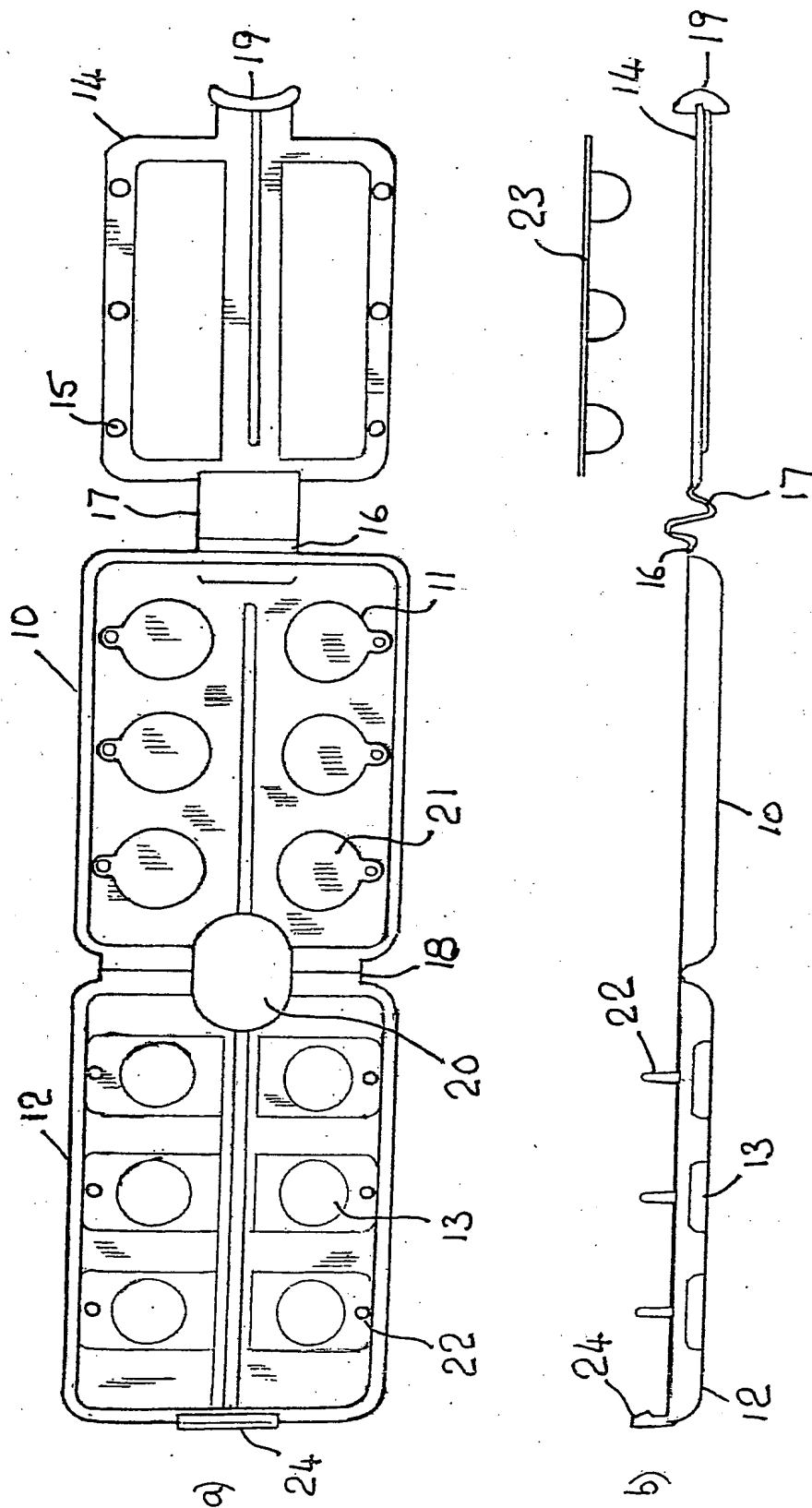
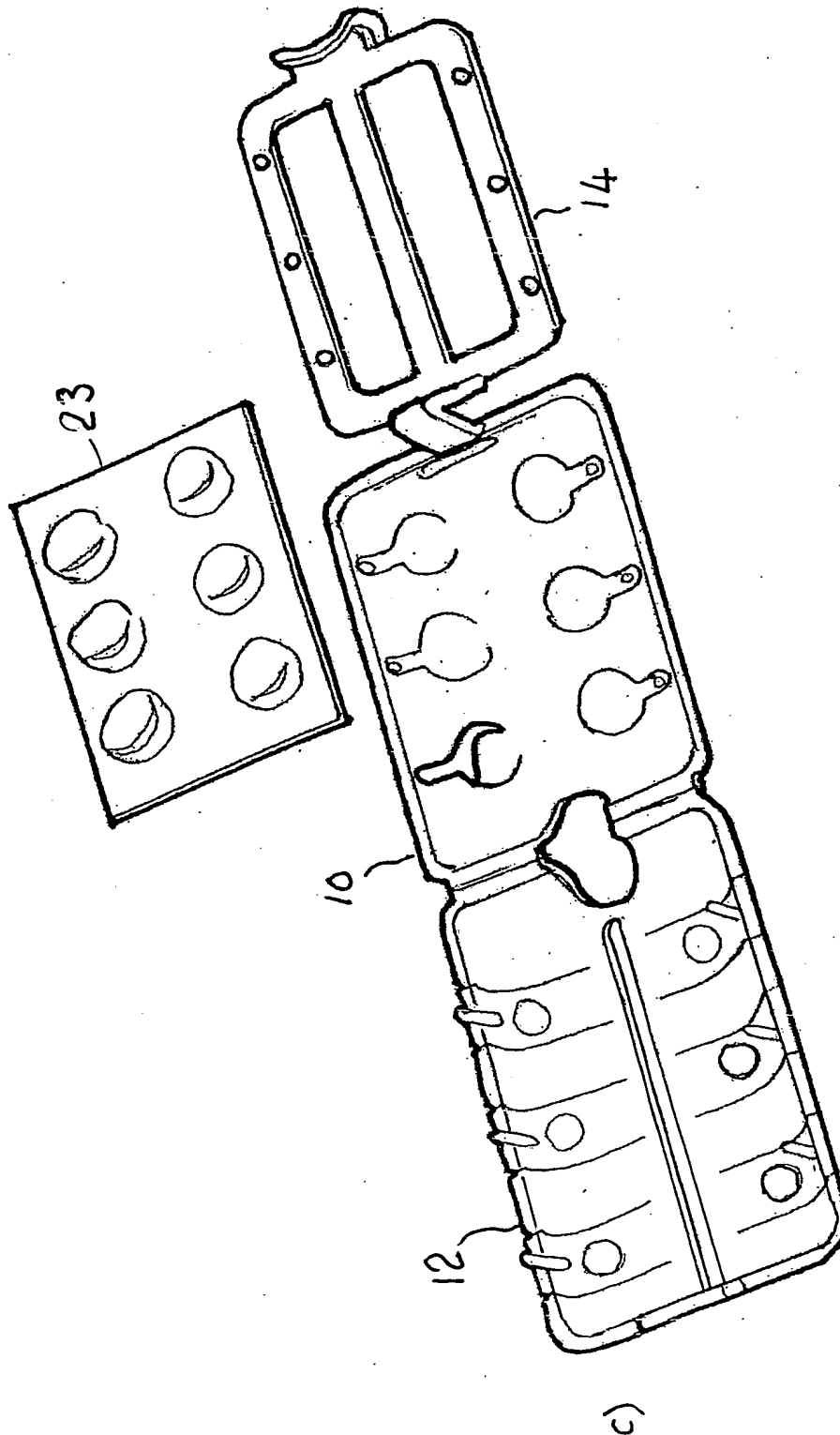


FIG 2.



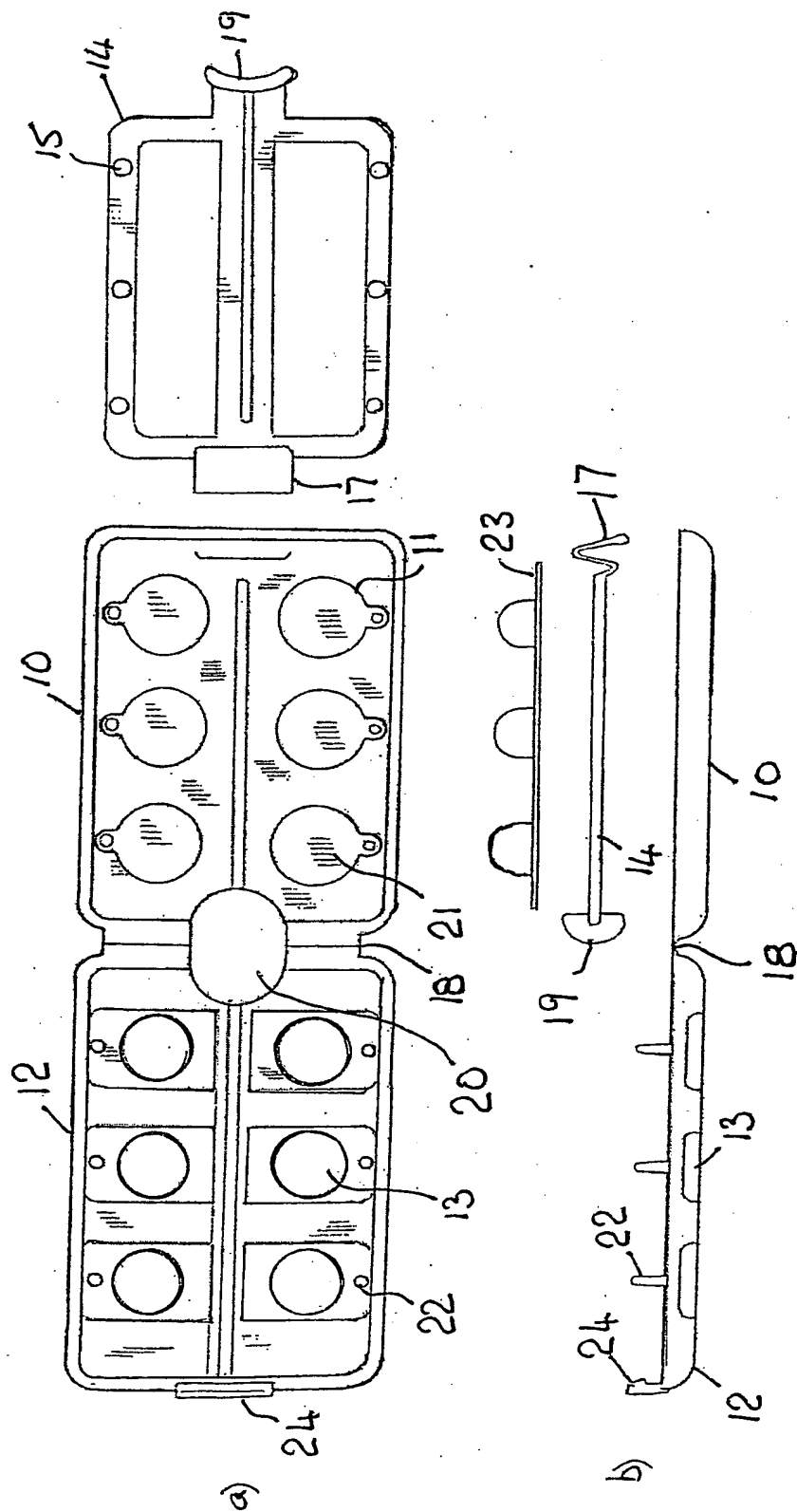


FIG. 3.

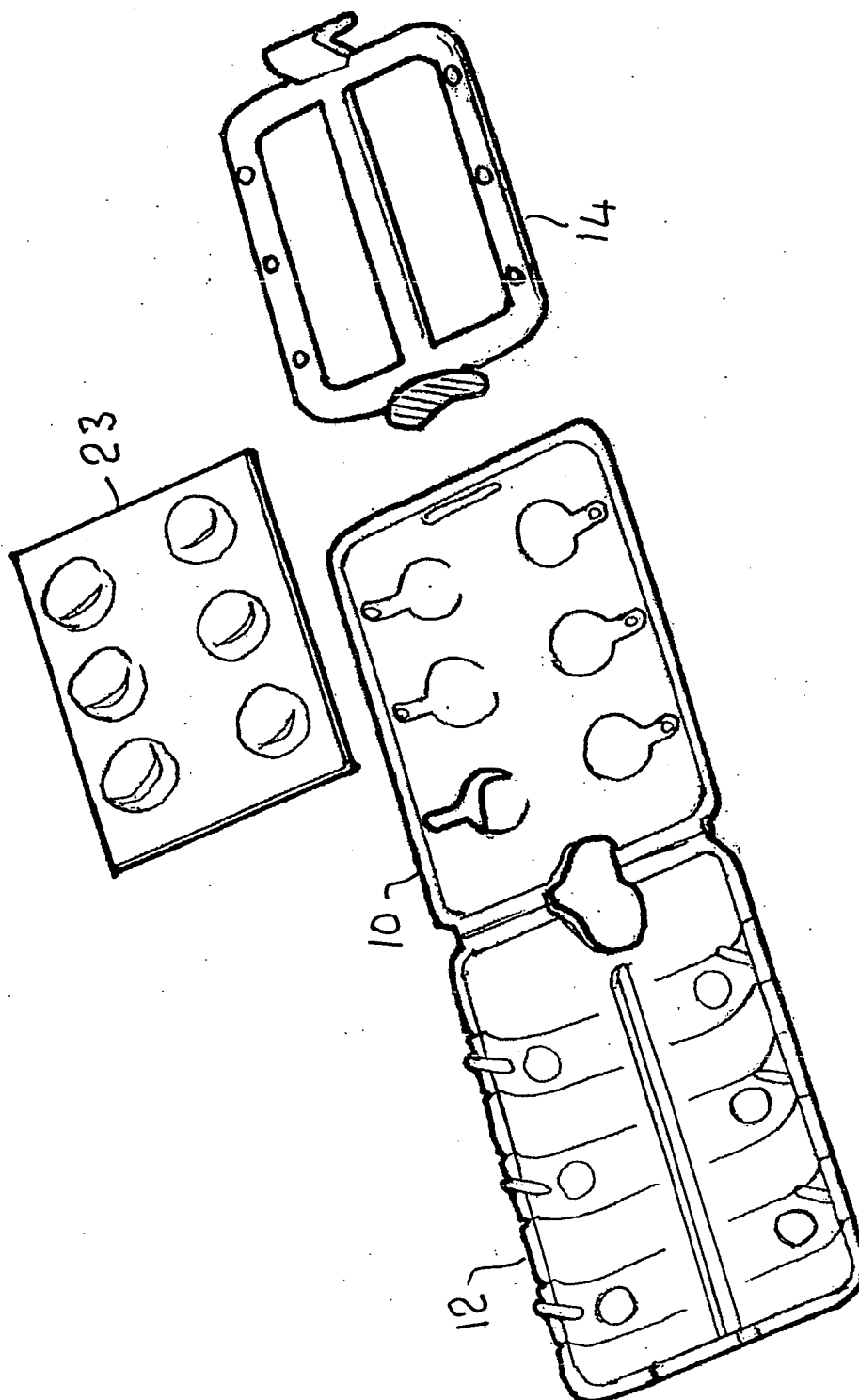


FIG 3

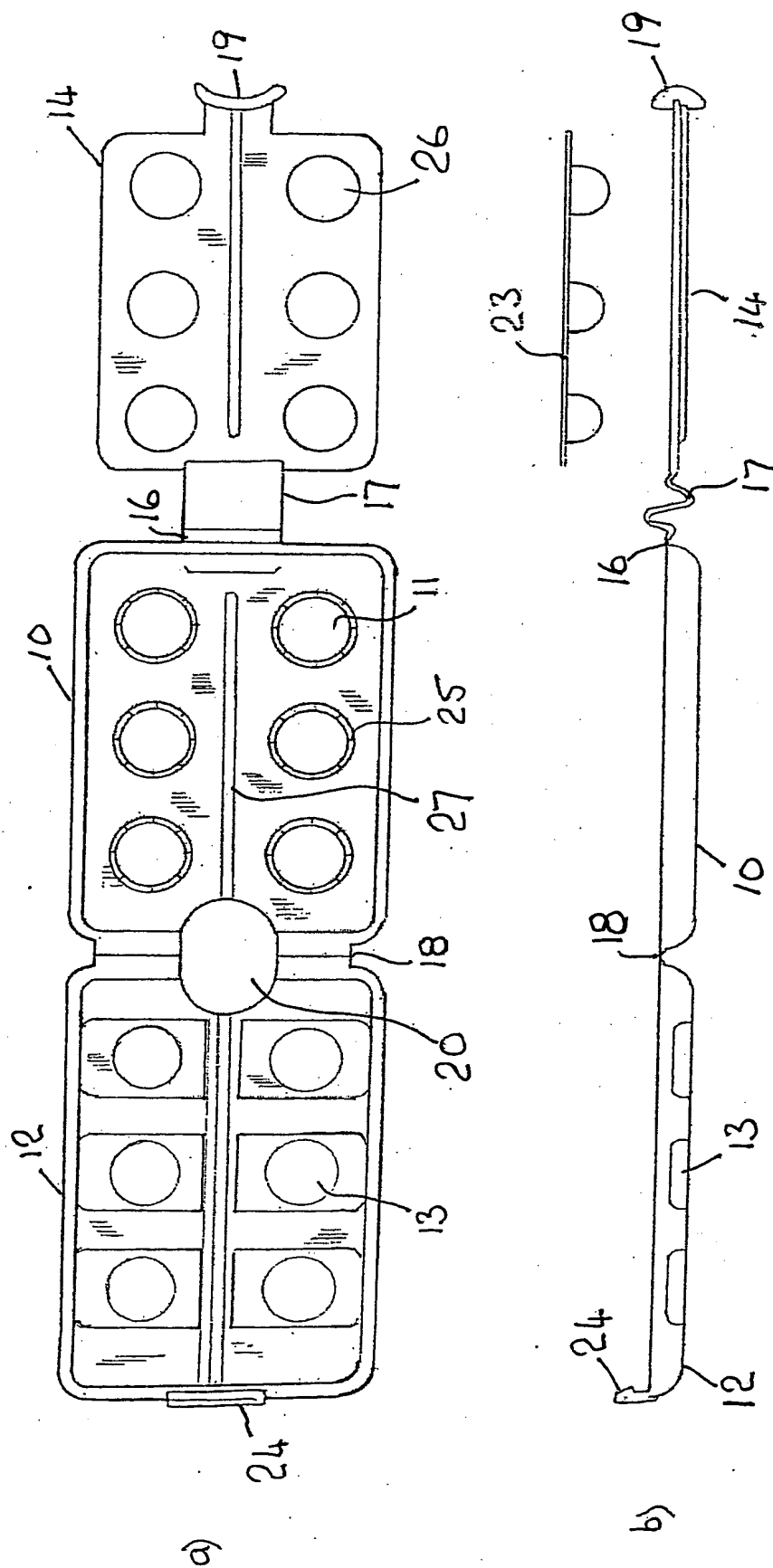


FIG. 4

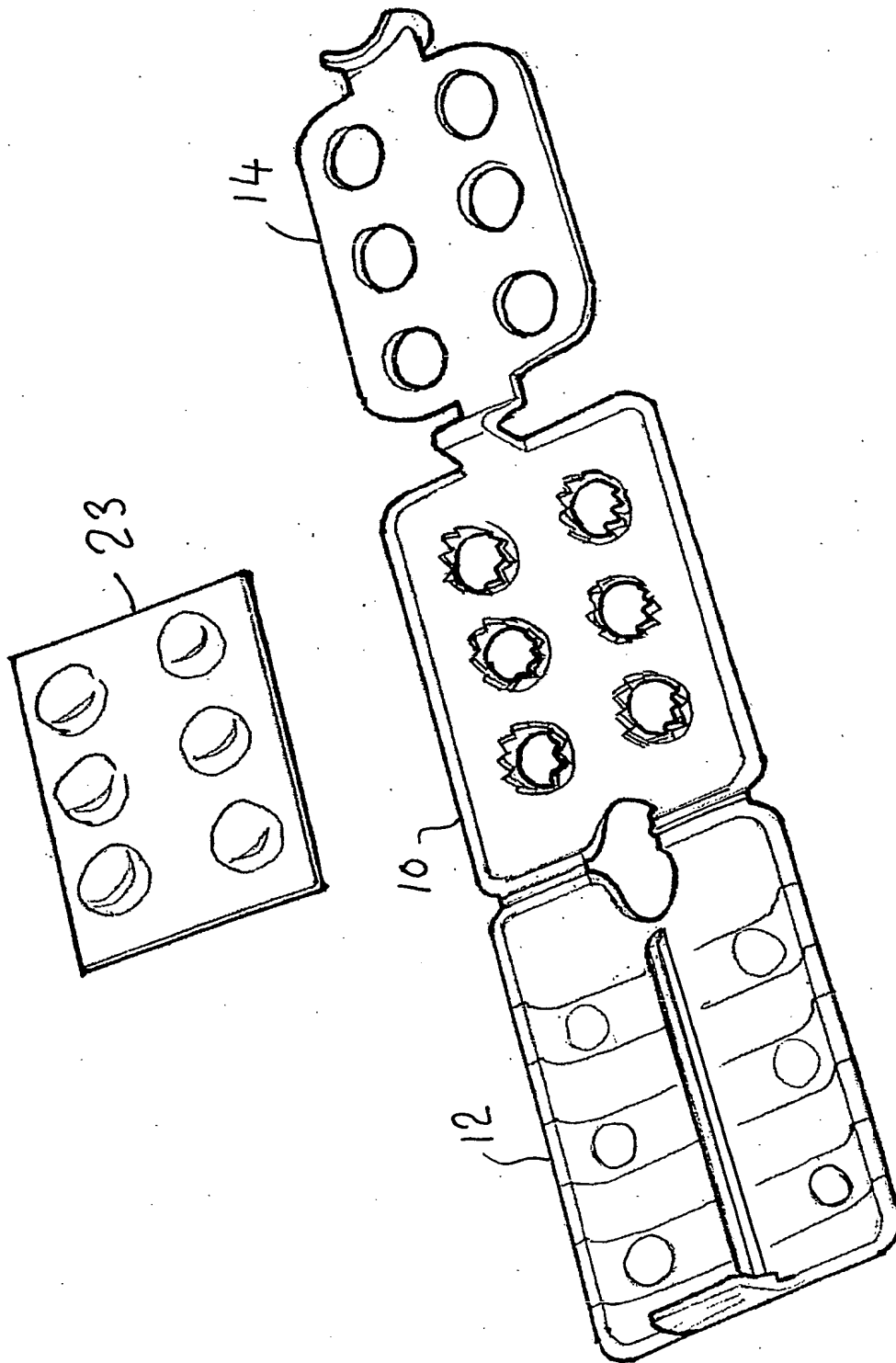


FIG 4

c)

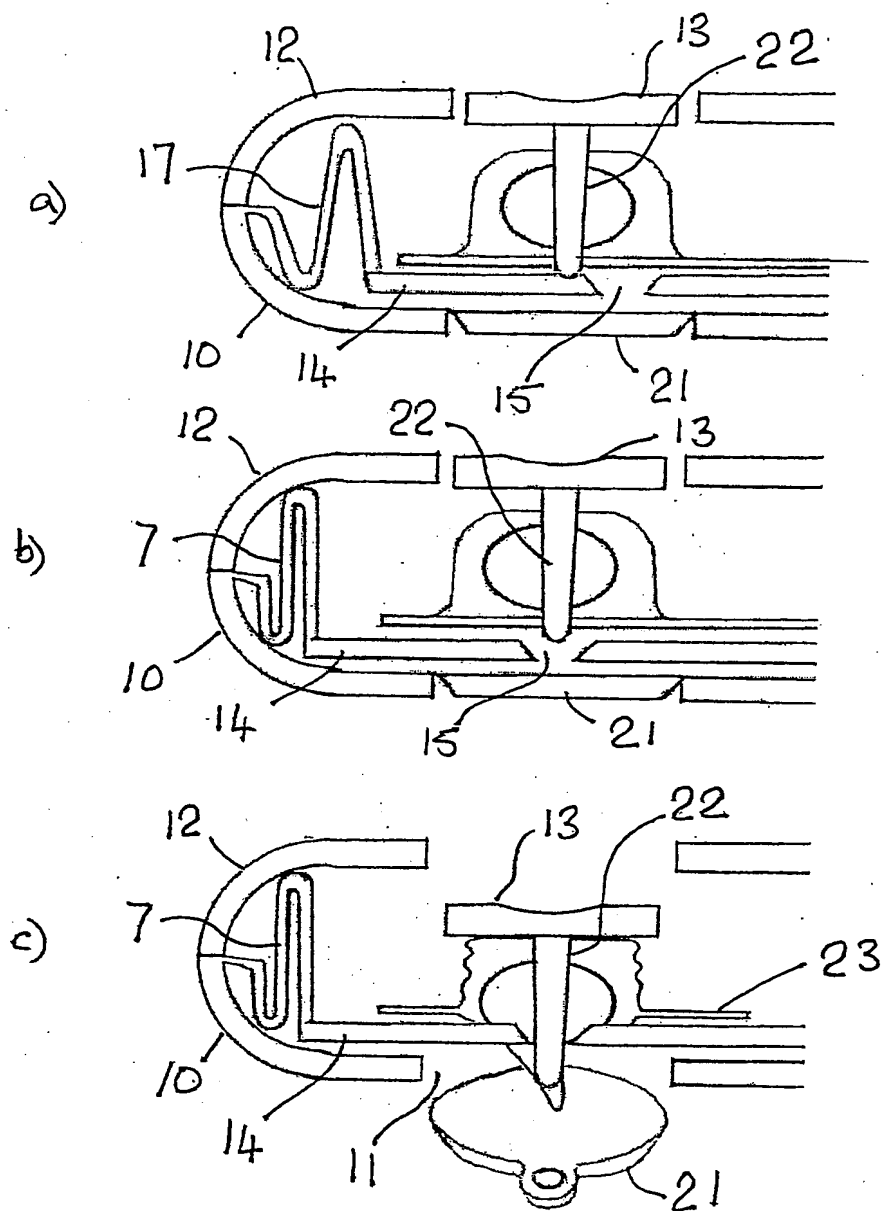


FIG. 5.

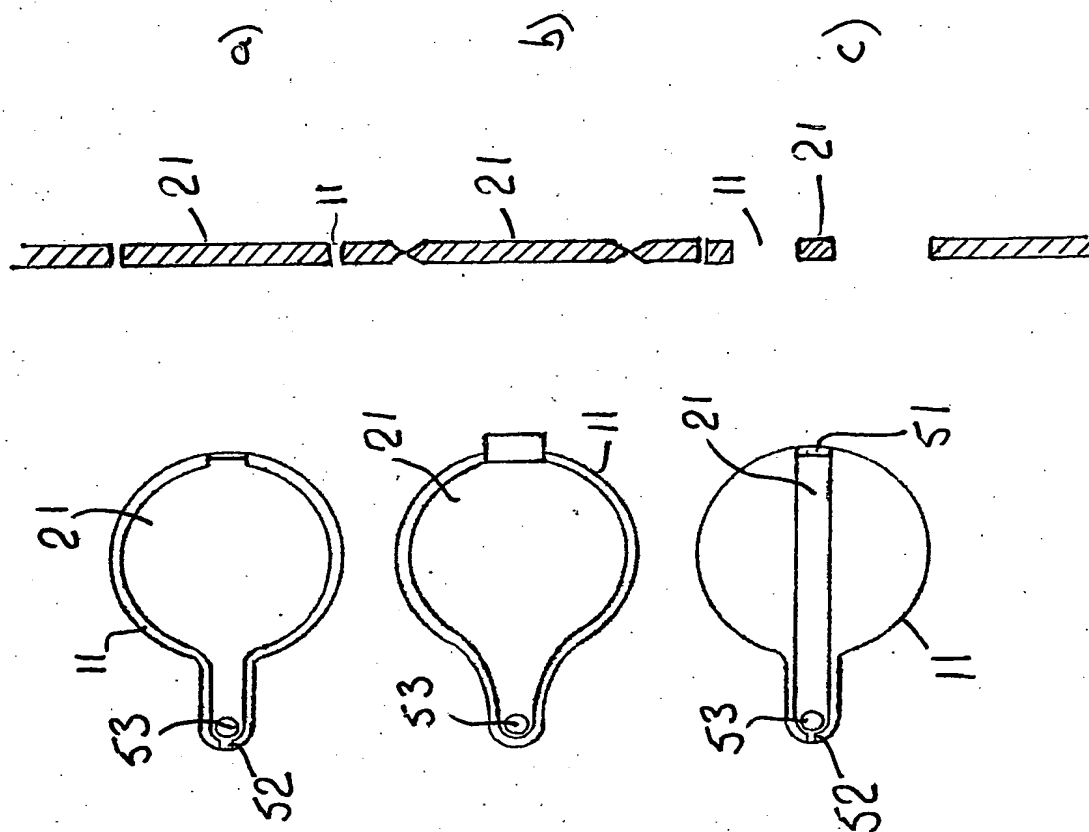


FIG. 6.

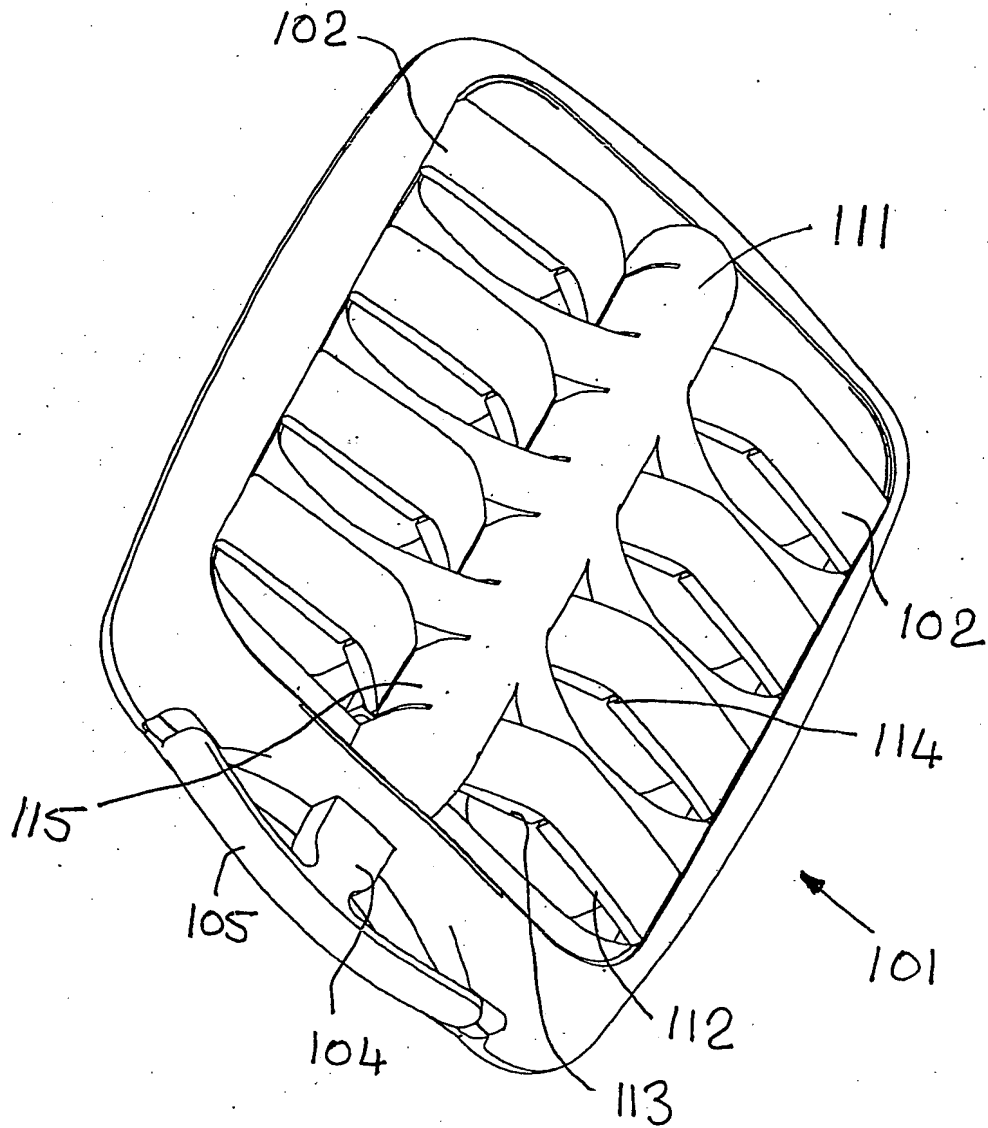


FIG. 7

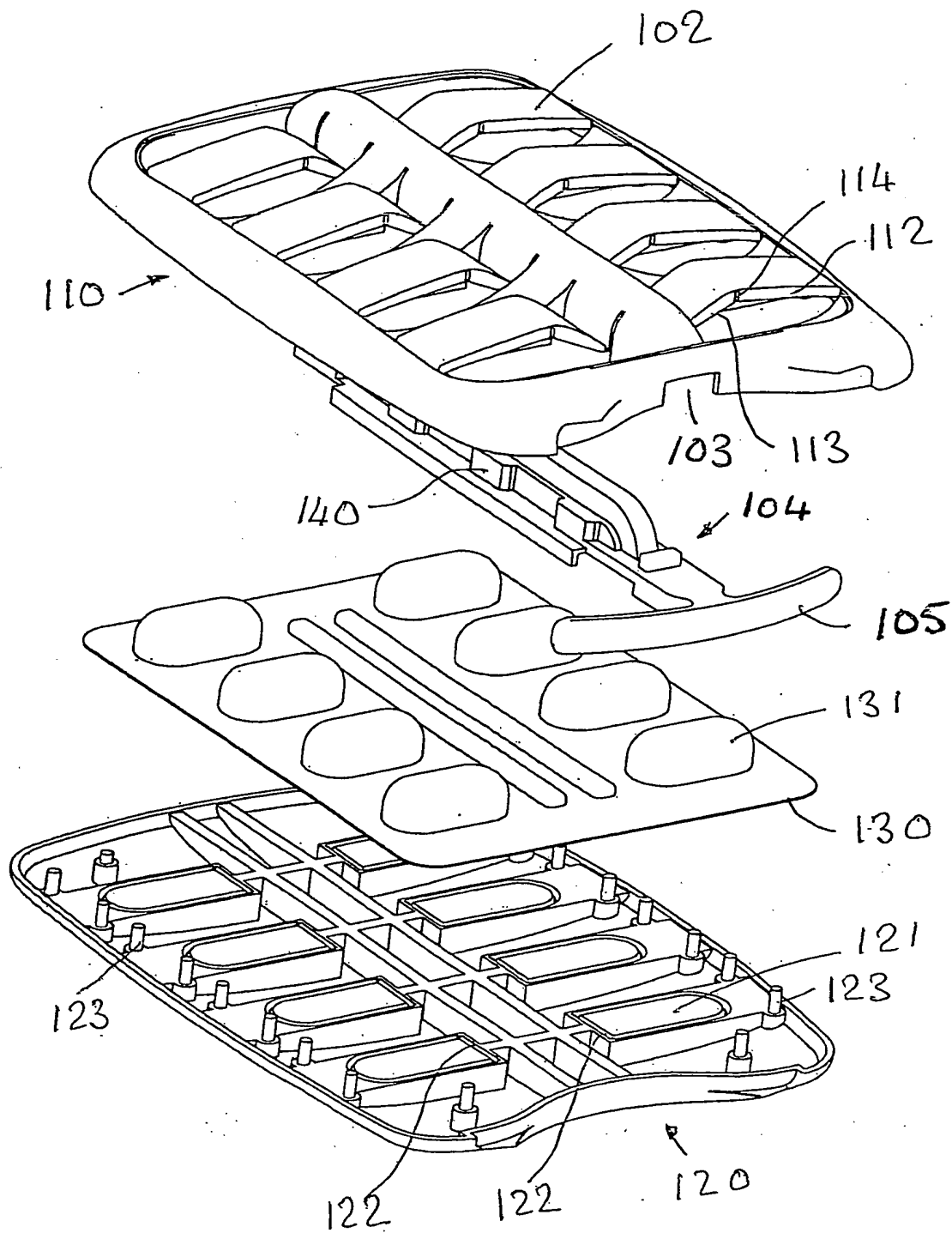


FIG. 8

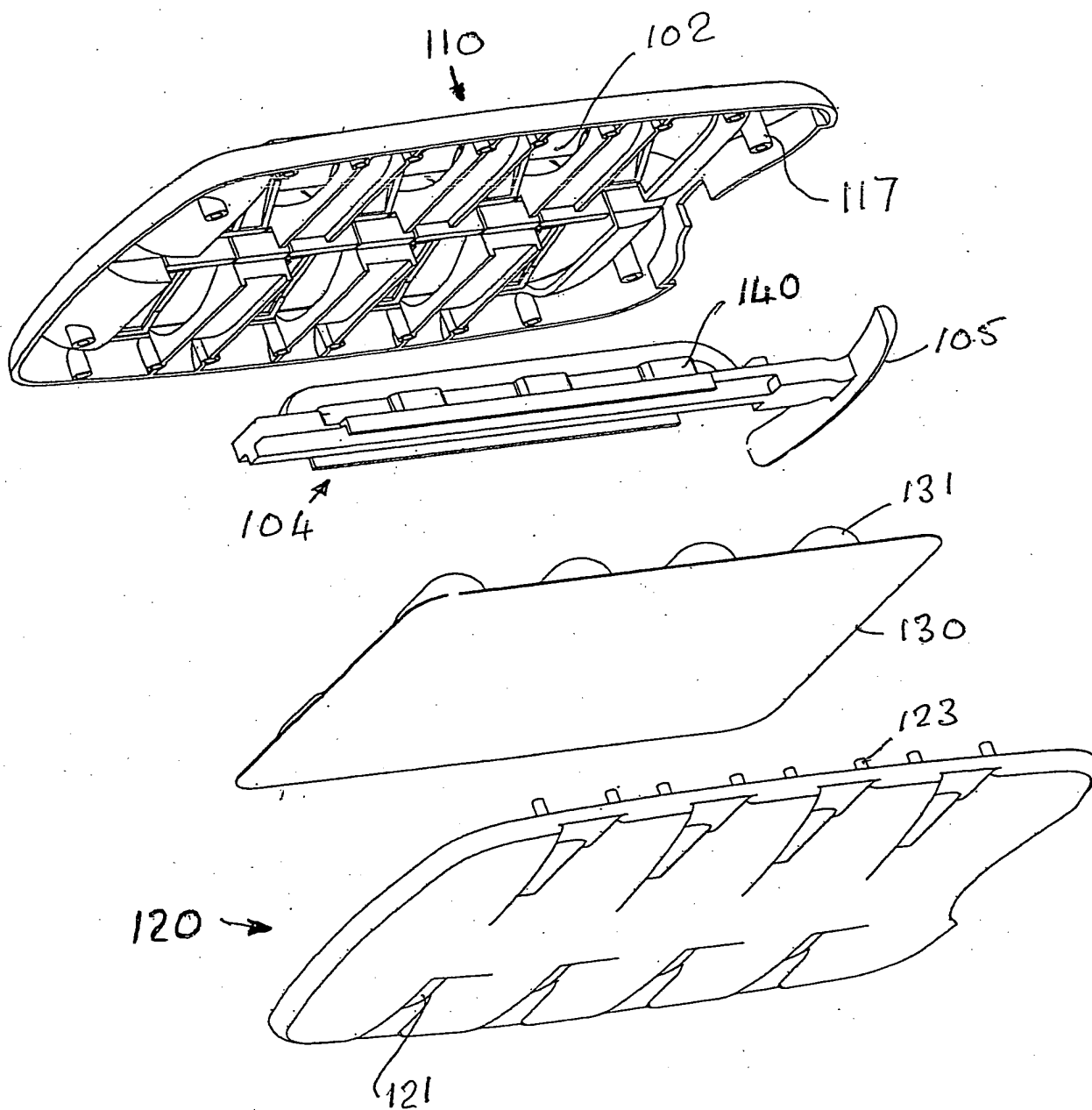


FIG. 9

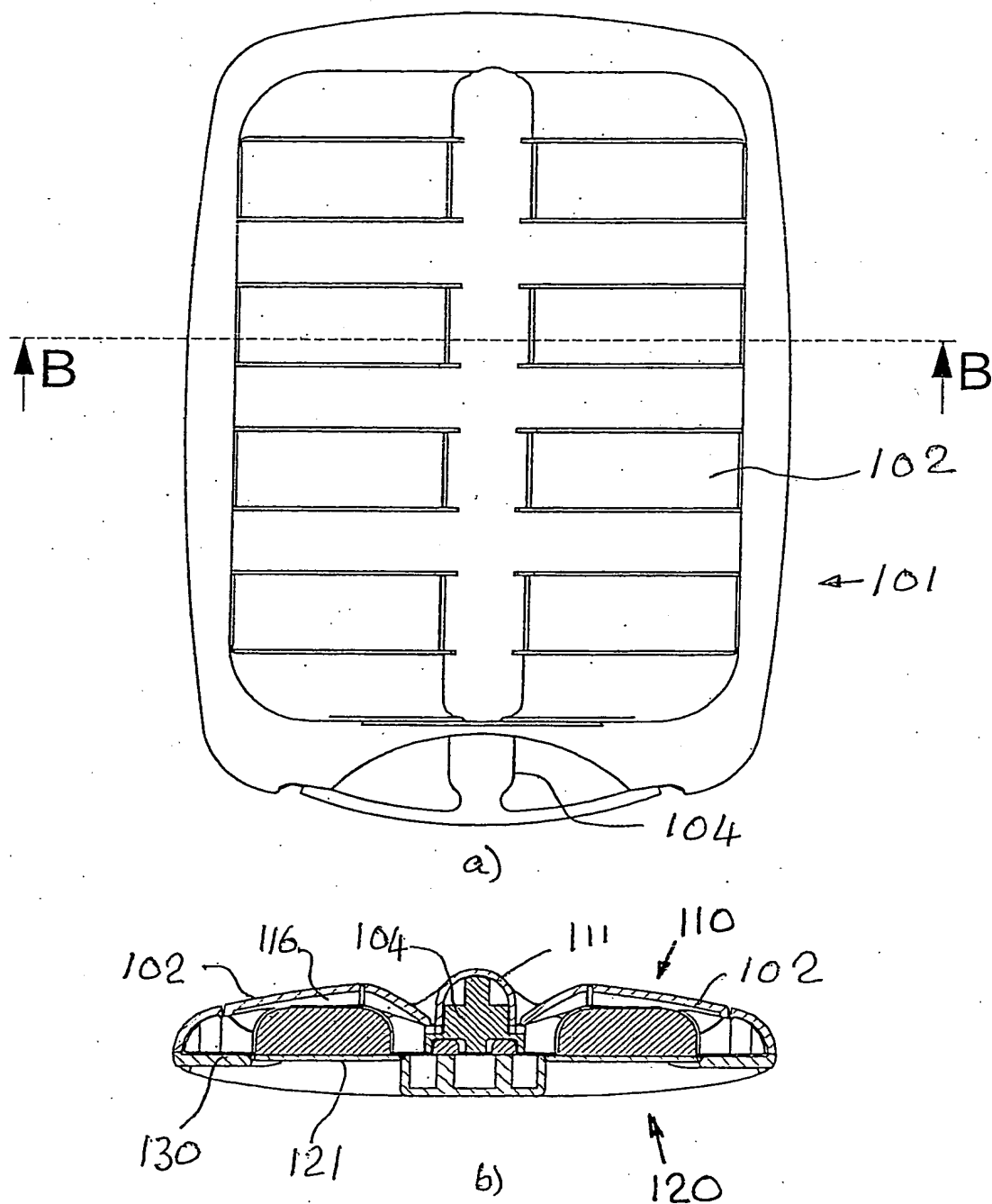
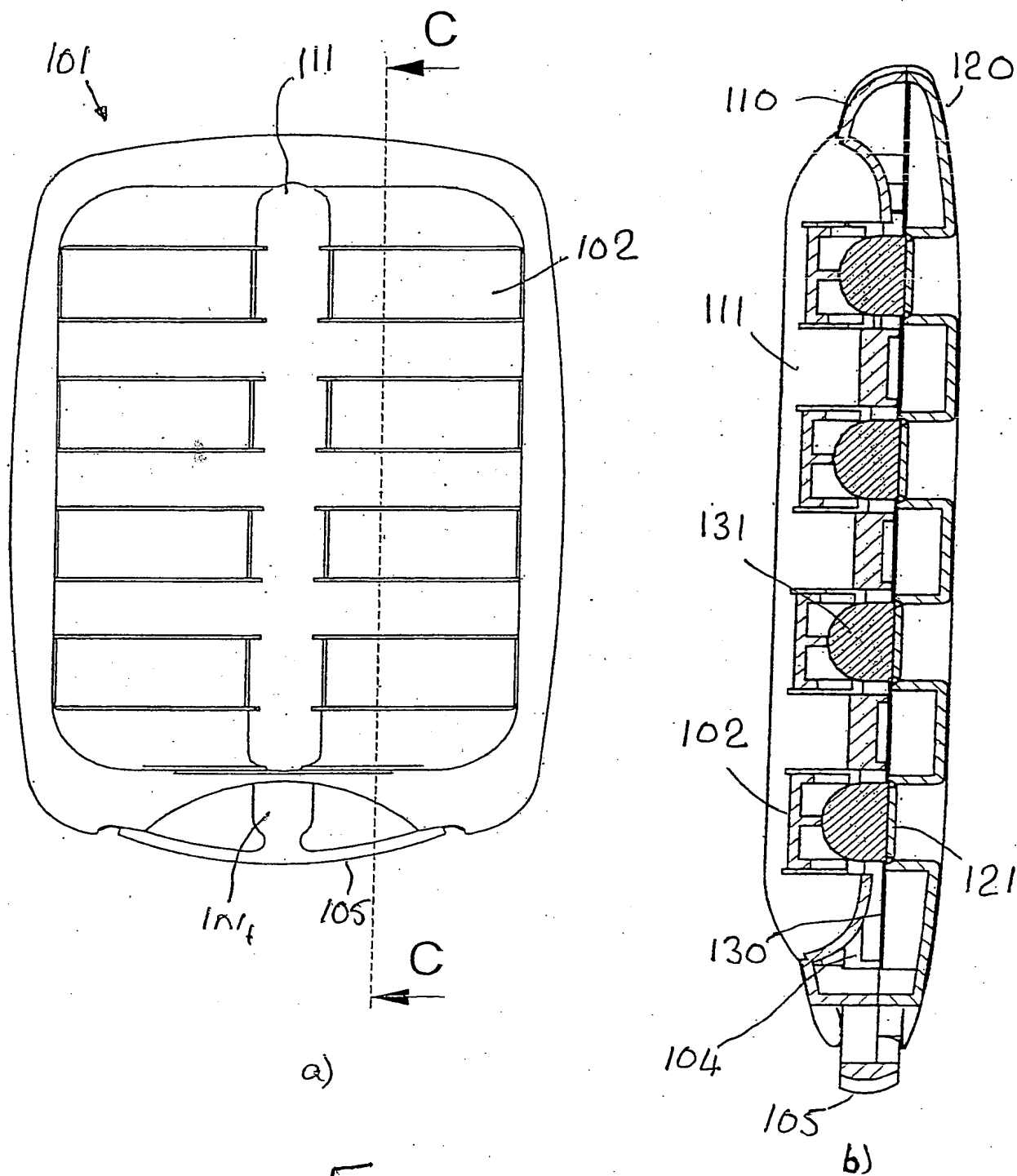


FIG 10



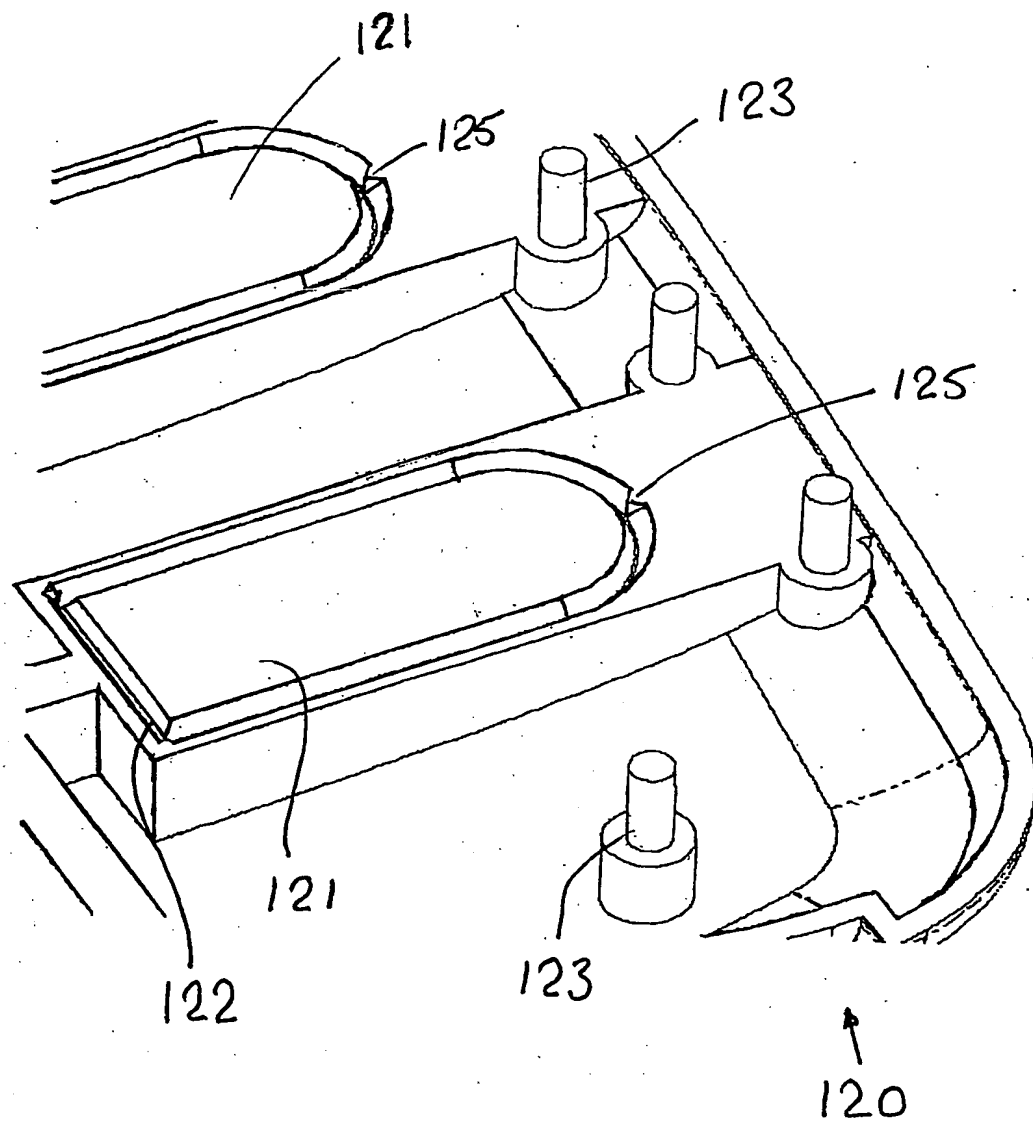
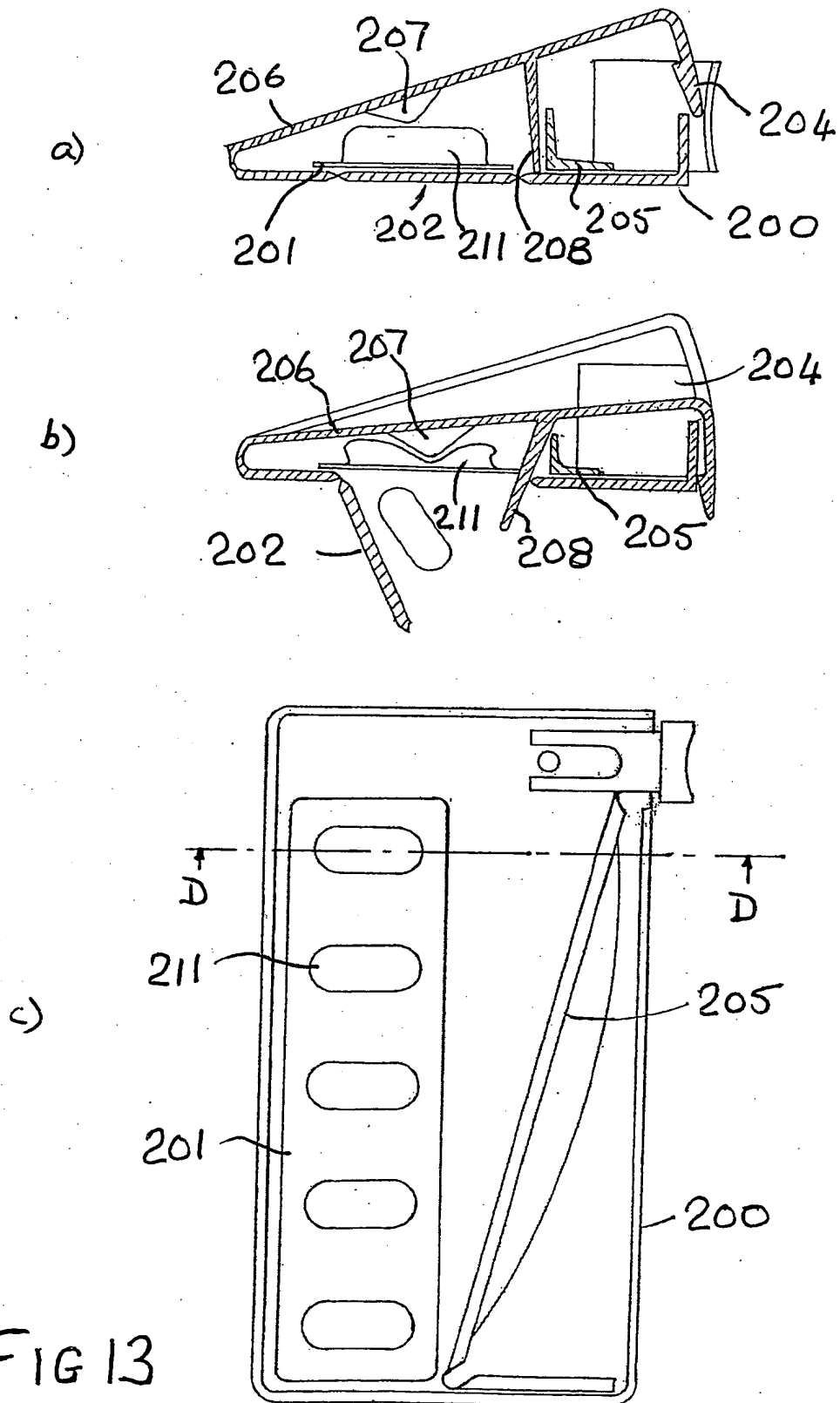


FIG 12



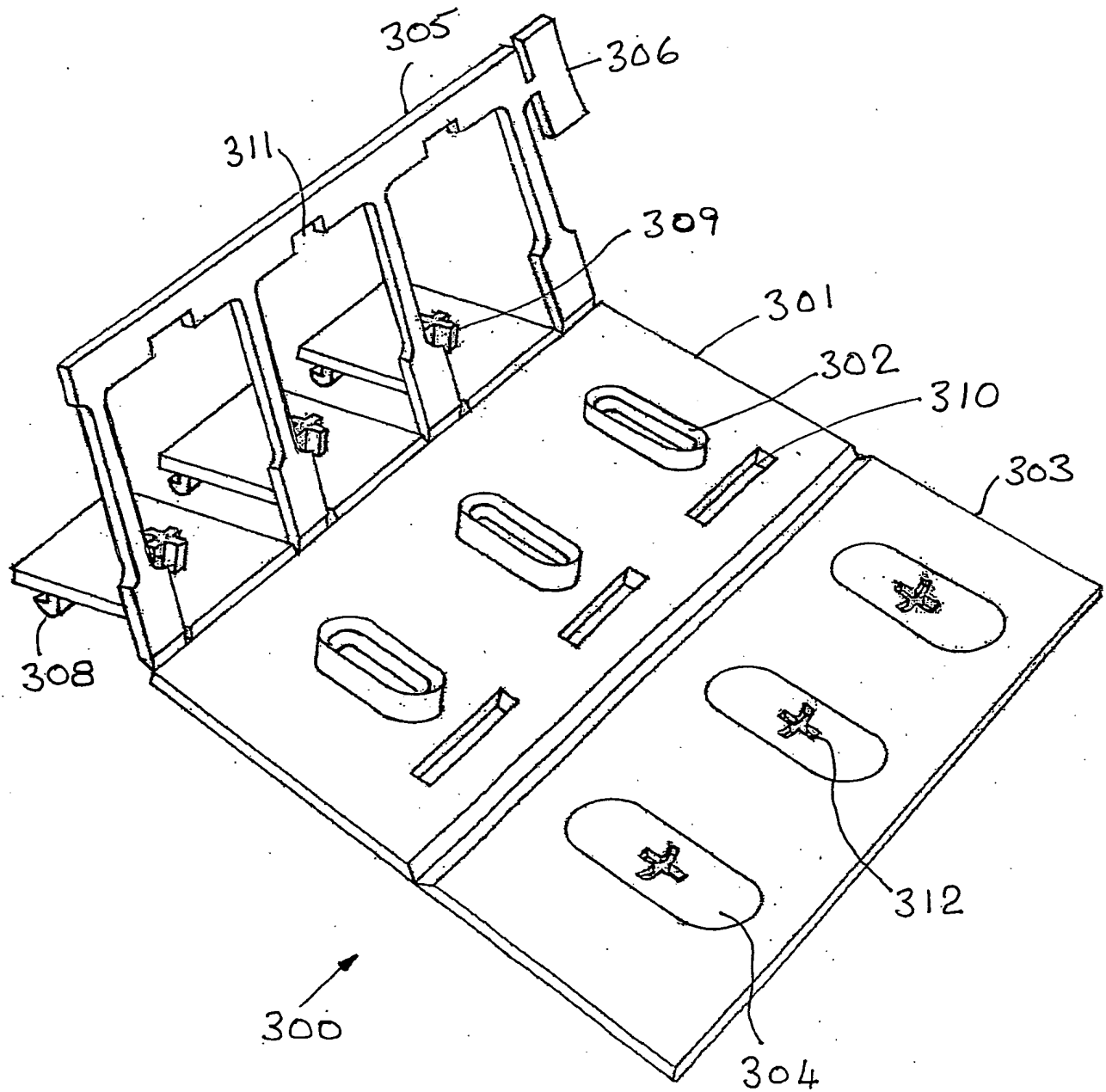


FIG 14

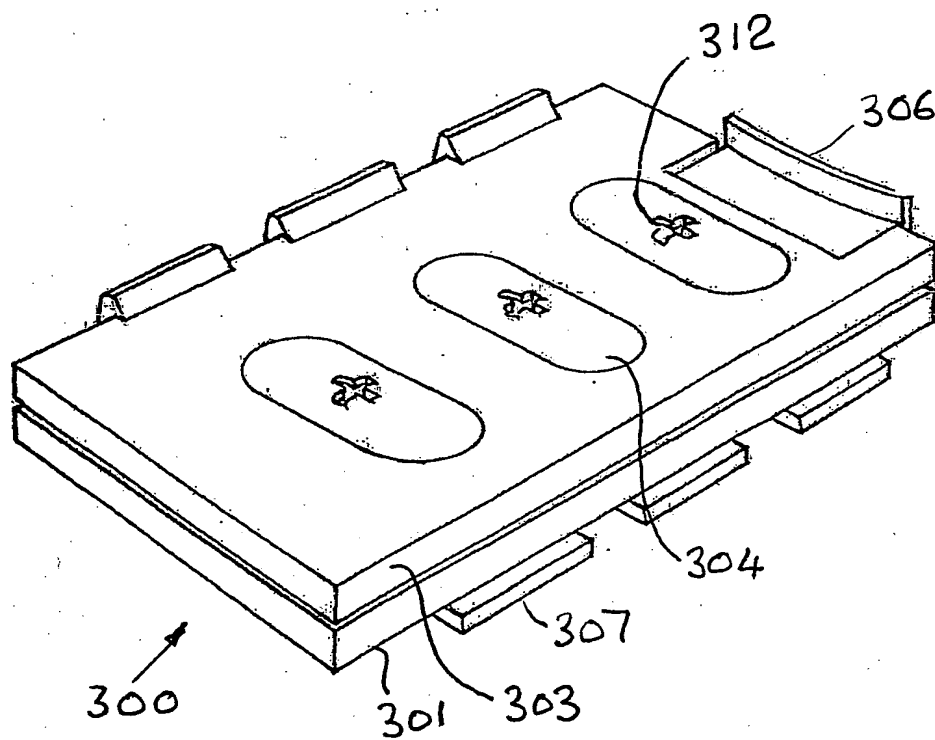


FIG 16

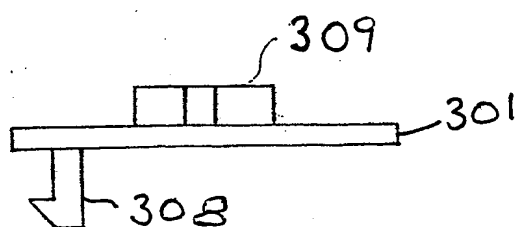


FIG. 15

INTERNATIONAL SEARCH REPORT

Int. Patent Application No
PCT/GB 02/05149

A. CLASSIFICATION OF SUBJECT MATTER IPC 7 B65D83/04 B65B69/00				
According to International Patent Classification (IPC) or to both national classification and IPC				
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) IPC 7 B65D B65B				
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched				
Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal, WPI Data, PAJ				
C. DOCUMENTS CONSIDERED TO BE RELEVANT				
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
X	FR 2 638 430 A (CHOLLET JEAN LOUIS) 4 May 1990 (1990-05-04) page 3, line 21 - line 28 page 5, line 2 - line 19 page 6, line 14 - line 22; figures 1,2,4,5	21		
A	----- US 5 150 793 A (TANNENBAUM MICHAEL A) 29 September 1992 (1992-09-29) figures	1		
A	----- US 5 244 091 A (TANNENBAUM MICHAEL A) 14 September 1993 (1993-09-14) figures	1		
A	----- EP 1 057 750 A (ALUSUISSE LONZA SERVICES AG) 6 December 2000 (2000-12-06) figures	1		
<input type="checkbox"/> Further documents are listed in the continuation of box C. <input checked="" type="checkbox"/> Patent family members are listed in annex.				
* Special categories of cited documents:				
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top; padding: 5px;"> *A* document defining the general state of the art which is not considered to be of particular relevance *E* earlier document but published on or after the international filing date *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) *O* document referring to an oral disclosure, use, exhibition or other means *P* document published prior to the international filing date but later than the priority date claimed </td> <td style="width: 50%; vertical-align: top; padding: 5px;"> *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. *Z* document member of the same patent family </td> </tr> </table>			*A* document defining the general state of the art which is not considered to be of particular relevance *E* earlier document but published on or after the international filing date *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) *O* document referring to an oral disclosure, use, exhibition or other means *P* document published prior to the international filing date but later than the priority date claimed	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. *Z* document member of the same patent family
A document defining the general state of the art which is not considered to be of particular relevance *E* earlier document but published on or after the international filing date *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) *O* document referring to an oral disclosure, use, exhibition or other means *P* document published prior to the international filing date but later than the priority date claimed	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. *Z* document member of the same patent family			
Date of the actual completion of the international search <div style="text-align: center; font-weight: bold;">28 January 2003</div>	Date of mailing of the international search report <div style="text-align: center; font-weight: bold;">06/02/2003</div>			
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer <div style="text-align: center; font-weight: bold;">Spettel, J</div>			

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 02/05149

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US 5244091	A	14-09-1993	US 5150793 A	29-09-1992
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			WO 0075044 A1	14-12-2000